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EXAMINER

AURORA, REENA

ART UNIT

PAPER NUMBER

2862

DATE MAILED: 08/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/950,093

Applicant(s)

DOGARU, TEODOR

Examiner

Reena Aurora

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 99 is/are pending in the application.
- 4a) Of the above claim(s) 1 - 50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 51 - 57, 59, 64, 66 - 71, 73 and 75 - 99 is/are rejected.
- 7) ☒ Claim(s) 58, 60 - 63, 65, 72 and 74 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. Applicant's election with traverse of group III in Paper No. 6 is acknowledged.

The traversal is on the ground(s) that searching each group will not be unduly burdensome. This is not found persuasive because the search required for group III is not required for group I or group II.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1 – 50 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 6.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 94 – 99 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 - 17 of U.S. Patent No.

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6,504,363. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 94 – 99 of the instant application are broader than and encompass the boundaries of claims 9 – 17 of the U.S. Patent No. 6,504,363.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 56, 59, 64, 66 – 71, 73, 75, 76, 78, 79, 81 – 86, 88, 89 and 91 - 93 are rejected under 35 U.S.C. 102(e) as being anticipated by Tiernan et al. (6,150,809).

7. As to claim 56, Tiernan et al. (hereinafter referred to as Tiernan) discloses a giant magnetoresistive sensors and sensor arrays for detection and imaging of anomalies in conductive materials including a coil (40) for inducing electromagnetic field in a specimen (20); and at least two coplanar magneto-resistive sensors (52, 62), wherein a flaw creates a perturbation in the induced electromagnetic field, and the at least two magneto-resistive sensors detect this perturbation (Fig. 1a and Fig. 11a).

7. As to claim 59, Tiernan discloses at least two coplanar magneto-resistive sensors (50) and the coil formed on a substrate (64) (Fig. 16).
8. As to claim 64, Tiernan discloses a giant magnetoresistive sensors and sensor arrays for detection and imaging of anomalies in conductive materials including a plurality of devices (50) each device comprising at least one coil (40) and at least one two dimensional magneto-resistive sensor (52, 62), the at least one coil (40) for inducing an electromagnetic field in the specimen (20); wherein a flaw creates a perturbation in the induced electromagnetic field, and the at least one two dimensional magneto-resistive sensors detects this perturbation (Note Fig. 1a and 11a).
9. As to claim 66, Tiernan discloses a plurality of devices (50) arranged in a one-dimensional array (Fig. 16).
10. As to claim 67, Tiernan discloses a plurality of devices (50) formed on a substrate (64) (Fig. 16).
11. As to claim 68, Tiernan discloses a plurality of devices (50) arranged in a two dimensional array (Fig. 16).
12. As to claim 69, Tiernan discloses a plurality of devices (50) formed on a substrate (64) (Fig. 16).
13. As to claims 70 and 71, Tiernan discloses at least two coplanar magneto-resistive sensors (50) and the coil formed on a substrate (64) (Fig. 16).
14. As to claim 73, Tiernan discloses a plurality of devices (50) arranged in a three dimensional array, the three-dimensional array comprising a stack of two-dimensional

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arrays, each two-dimensional array comprising at least one device formed on a substrate (Fig. 16).

15. As to claims 75 and 78, Tiernan discloses a giant magnetoresistive sensors and sensor arrays for detection and imaging of anomalies in conductive materials including an excitation coil (40) for inducing eddy currents in the specimen (20); and at least one magneto-resistive sensor having a sensitive axis tangentially-aligned with the edge of the specimen (20), wherein the flaw at the edge creates a perturbation in the induced eddy currents and the at least one magneto-resistive sensor detects this perturbation (Fig. 1a and 11a).

16. As to claims 85 and 88, Tiernan discloses a coil (40) for inducing eddy currents in the specimen (20); a magneto-resistive sensor (50) or an array of magneto-resistive sensor as claimed in claim 88, having an axis of sensitivity coplanar with the cross-section and orthogonal to the axis of symmetry, with the magneto-resistive sensor disposed on the axis of symmetry and at least one of exterior to the coil and interior to the coil (40); wherein the flaw creates a perturbation in the induced eddy currents and the magneto-resistive sensor detects this perturbation (1Fig. 1a and 11a).

17. As to claims 76, 79, 86 and 89, Tiernan discloses the magneto-resistive sensor comprising giant magneto-resistive sensors (50) (Fig. 1a and 11a).

18. As to claims 81 - 84, Tiernan discloses magneto-resistive sensors (50) formed on a substrate (64). Tiernan further discloses circular shape of the excitation coil (46) (Fig. 4b and 16).

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19. As to claim 91, Tiernan discloses an array of magneto-resistive sensors (50) formed on a substrate (64) (Fig. 16).

20. As to claims 92 and 93, Tiernan discloses the cross section of the coil (40) having a "D" shape (Fig. 2a).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 51 – 55, 57, 77, 80, 87 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiernan (6,150,809).

23. As to claims 51 – 54, 77, 80, 87 and 90 Tiernan et al. (hereinafter referred to as Tiernan) discloses a giant magnetoresistive sensors and sensor arrays for detection and imaging of anomalies in conductive materials including a coil (40) for inducing an electromagnetic field in a specimen (20); and a giant magnetoresistive sensor (50) having a sensitive axis (52) wherein a flaw creates a perturbation in the induced electromagnetic field and the spin dependent tunneling sensor detects this perturbation (Fig. 1a, Column 9, Lines 12 - 59). Tiernan fails to show a spin dependent tunneling sensor. However, giant magnetoresistive sensor and spin dependent tunneling sensor can both be used for determining the flaws in a specimen. Therefore it would have been obvious to one of ordinary skill in the art to have substitute a giant

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magnetoresistive sensor with a spin dependent tunneling sensor, as substituting known sensors for the same purpose would provide similar results (Fig. 1a and 11a) (Note MPEP 2144.06).

24. As to claims 55 and 57, Tiernan fails to disclose a flat coil. It is known in the art to use flat coil to simulate parallel uniform sheets of current. Therefore it would have been obvious to one of ordinary skill in the art to have made the device of Tiernan wherein the coil for inducing electromagnetic field in the specimen is a flat coil such that flat coils simulate parallel uniform sheets of current on the specimen thereby increasing the surface area of the induced electromagnetic field (Note MPEP 2144.03).

Allowable Subject Matter

25. Claims 58, 60 - 63, 65, 72 and 74 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

26. As to claim 58, the prior art fails to show a third sensor for measuring the electromagnetic field in a direction perpendicular to the plane. This feature in combination with the other limitations of claim 56 renders the claim allowable over prior art.

27. As to claim 60, the prior art fails to show a third sensor for measuring the electromagnetic field in a direction perpendicular to the plane, and wherein the at least two coplanar magneto-resistive sensors, the third sensor, and the coil are formed on a

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substrate. This feature in combination with the other limitations of claim 56 renders the claim allowable over prior art.

28. As to claims 61 and 62, the prior art fails to show two coplanar giant magneto-resistive sensors orthogonally arranged about a central point and external to the coil. This feature in combination with the other limitations of claim 56 renders the claim allowable over prior art.

29. As to claim 63, the prior art fails to show a Hall effect sensor for measuring the electromagnetic field in a direction perpendicular to the plane, wherein at least two coplanar magneto-resistive sensors include giant magneto-resistive sensors orthogonally arranged about a central point. This feature in combination with the other limitations of claim 56 renders the claim allowable over prior art.

30. As to claim 65, the prior art fails to show a third sensor for measuring the electromagnetic field in a direction perpendicular to the plane. This feature in combination with the other limitations of claim 64 renders the claim allowable over prior art.

31. As to claim 72, the prior art fails to show that each device further include a Hall effect sensor measuring electromagnetic field in a direction perpendicular to the plane, with the at least one two dimensional magneto-resistive sensor, the Hall effect sensor, and the coil formed on the substrate. This feature in combination with the other limitations of claim 64 renders the claim allowable over prior art.

32. As to claim 74, the prior art fails to show at least one two coplanar magneto-resistive sensors include giant magneto-resistive sensors orthogonally arranged about a

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central point. This feature in combination with the other limitations of claim 64 renders the claim allowable over prior art.

Prior Art of Record

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

34. Daughton et al. (6,072,382) is cited for its disclosure of a spin dependent tunneling sensor.

35. Yarmchuk (5,648,720) is cited for its disclosure of an apparatus and method for producing a magnetic image of a conductive pattern using eddy currents.

36. Collins et al. (4,870,360) is cited for its disclosure of an apparatus for identifying an electrically conducting material.


37. Murakami (5,450,009) is cited for its disclosure of a magnetic sensor and structure of its mounting.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reena Aurora whose telephone number is 703-605-1372. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3432 for regular communications and 703-305-3432 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Reena Aurora
July 24, 2003


N. Le
Supervisory Patent Examiner
Technology Center 2800